

- Global awareness.
- Group participation and social interaction.
- Communication
- Professional Effectiveness.

B. Biology Sequence Outcomes

- Demonstrate an ability to apply and understand the scientific method and its limitations in the search for answers to biological questions
- Recognize the role of scientific analysis in creating an understanding of the biology of the gene
- Appraise the role of modern evolutionary theory as the major unifying theme of all biological sciences.
- Demonstrate knowledge of basic terminology used in the study of the human body.
- Describe anatomical characteristics of human organ systems.
- Describe basic physiological processes of the human body.
- Explain how human organ systems interact to maintain homeostasis.

The Liberal Arts and Sciences program learning outcomes are being reviewed by the division during Spring 2001.

III. **Assessment Method(s)**: A measurable indicator of success in attaining the stated learning outcome(s). The methodology should be both reliable and valid. Please describe in detail.

- a. Formative Assessment Methods(s) and Description: a measurable indicator of student in-progress success in attaining the stated learning outcome(s).

The Biology Department, since the 1994-95 academic year, has used assessment tools. Two assessment instruments are used, one for the General Biology Series (BIO 111,112,113) and another for Anatomy & Physiology (BIO 141, 142, 143).

The General Biology Assessment Test is given to students during the first week of BIO 111. The same test is administered again at the end of BIO 113. The purposes of the pre/post tests are to establish a basis for determining learning gains and to measure gains. The pretest administered in BIO 111 is not used in calculation of the final grade, but the posttest may be included in the last regular test in BIO 113 at the instructor's discretion. Most students who enroll in this sequence are transfer students and non-science majors.

The Anatomy and Physiology Assessment Test is given to students during the first week of BIO 141. The same test is administered again at the end of BIO 143. The purposes of the pre/post tests are to establish a basis for determining learning gains and to measure gains. The pretest administered in BIO 141 is not used in calculation of the final grade, but the posttest may be included in the last regular test in BIO 143 at the instructor's discretion. Most students who enroll in this sequence are fulfilling requirements related to Allied Health programs.

The Biology department has developed common syllabi with common objectives for each course in the sequence. Each instructor develops his/her own individual exams.

- b. Summative Assessment Method(s) and Description: a measurable indicator of end-of-program success in attaining the stated program learning outcome(s).

This section is not applicable to sequence assessment. Refer to the section in this Report on the summative assessment of the program learning outcomes for Liberal Arts and Sciences.

- IV. **Results:** A description of the actual results of overall student performance gathered from the summative assessment(s). (see III.b.)

General Biology Assessment Test Results

Pretest Bio-111	Number of Students Tested	Median Score out of 25	Mean Score out of 25		Standard Deviation
Fall 1998	272	9.50	8.33	33.3%	2.51
Winter 1999	50	5.50	8.66	34.6%	2.51
Spring 1999	95	7.82	8.22	32.9%	2.48
Fall 1999	117	8.47	8.72	34.9%	2.65
Winter 2000	146	8.08	8.25	34.0%	2.27
Spring 2000	89	9.08	9.34	37.3%	2.86
Fall 2000	218	8.55	8.58	34%	2.41

Post Test Bio-113	Number of Students Tested	Median Score out of 25	Mean Score out of 25		Standard Deviation
Fall 1998	33	12.88	13.15	52.6%	3.16
Winter 1999	40	13.50	13.28	52.8%	2.77
Spring 1999	39	14.00	13.77	55.1%	3.33
Fall 1999	32	12.90	12.78	51.1%	3.30
Winter 2000	27	14.00	14.15	56.6%	3.83
Spring 2000	53	14.50	14.14	56.6%	3.64
Fall 2000	20	12.83	12.45	49.8%	3.40

Anatomy and Physiology Assessment Test Results

Pretest Bio-141	Number of Students Tested	Median Score out of 25	Mean Score out of 25		Standard Deviation
Winter 1998	214	--	8.3	33.0%	3.15
Spring 1998	159	--	8.25	34.0%	3.07
Fall 1998	182	7.21	7.26	29.0%	2.63
Winter 1999	118	7.89	8.16	33.0%	2.94
Winter 2000	134	7.87	7.76	31.0%	3.21
Spring 2000	143	6.43	7.09	28.0%	2.99
Summer 2000	14	6.00	7.07	29%	3.17

Fall 2000	182	7.95	8.31	33%	3.57
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Post Test Bio-143	Number of Students Tested	Median Score out of 25	Mean Score out of 25		Standard Deviation
Winter 1998	7	--	15.86	63.0%	2.64
Spring 1998	53	--	17.00	68.0%	3.29
Fall 1998	--	--	--	--	--
Winter 1999	47	14.00	13.76	53.0%	2.76
Winter 2000	51	15.06	15.04	60%	3.87
Spring 2000	72	15.5	14.93	60%	3.57
Summer 2000	41	15.86	16.27	65%	3.45

The “empty” blocks in the chart above are due to an oversight on the statistics kept. This has now been corrected.

- V. **Analysis/Actions:** From analysis of your summative assessment results, do you plan to or have you made any adjustments to your program learning outcomes, methodologies, curriculum, etc.? If yes, describe. If no, explain.

Program learning outcomes have not changed. However, the Biology department continually evaluates its courses and refreshes its syllabi, revises lab manuals and exercises, updates the curriculum, and modifies topics as needed. As the basic science and understanding of biology grows, we upgrade our program.

- VI. **General Education:** A description of where and how within the major the three primary general education outcomes* (communication, thinking, values/citizenship/community) are assessed.

- a. Where within the major do you assess written communication? Describe the assessment method(s) used. Describe assessment results if available.

BIO 205, Microbiology, uses case studies that include both written and oral communication activities. The department has developed their own checklist for assessing these skills.

- b. Where within the major do you assess oral communication? Describe the assessment method(s) used. Describe assessment results if available.

BIO 205, Microbiology, uses case studies that include both written and oral communication activities. The department has developed their own checklist for assessing these skills.

- c. Where within the major do you assess thinking? Thinking might include inventing new problems, seeing relationships and/or implications, respecting other approaches, demonstrating clarity and/or integrity, or recognizing assumptions. Describe the assessment method(s) used. Describe assessment results if available.

All Biology courses assess thinking through lab activities, applications of the scientific method and course testing. The chart in the Results section shows data collected on thinking skills.

- d. Where within the major do you assess values/citizenship/community? These activities might include behaviors, perspective, awareness, responsibility, teamwork, ethical/professional standards, service learning or community participation. Describe the assessment method(s) used. Describe assessment results if available.

Biology labs require students and faculty to follow OSHA standards for safety behaviors. For example, eye protection is required in all labs; students not complying must either correct the problem or they cannot participate. No other safety violations have been a problem.

BIO 297, Tropical Ecology, involves students in community field trips to promote cultural awareness and global citizenship.

Teamwork activities are used in many Biology courses; teams are used in all Biology labs. Teamwork activities integrate many general education skills: oral communication, thinking, valuing others and sometimes written communication. The BIOSIS open Lab also promotes teamwork and collaborative learning.

The department keeps copies of all the general education checklists on file and available to faculty. Some faculty have attended General Education Day.

The department has assisted the General Education Committee in doing summative assessment research by providing copies of student work when requested.

VII. Recommendations

The Biology department needs data on how students perform in Biology courses after they transfer to four-year institutions. Assistance from IPR is requested.

- * Note: The oral communication checklist and the written communication checklist developed by the General Education Committee were adopted for college-wide use during the 1997-98 academic year by Academic Council. Thinking Guidelines developed by the General Education Committee were piloted by faculty during the 1998-99 academic year. A student honor code will be piloted during Spring Quarter 2001.